From Hospital to Home to Participation: A Position Paper on Transition Planning after Stroke

Kristine K. Miller, PT, PhD
Indiana University
Department of Physical Therapy

Susan H. Lin, ScD, OTR/L, FAOTA
Massachusetts General Hospital Institute of Health Professions
Department of Occupational Therapy

Marsha Neville, OT, PhD
Texas Woman's University
School of Occupational Therapy

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Corresponding Author:

Kristine Miller, 317-274-3534, kkmiller@iu.edu

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Abstract

Based on a review of the evidence, members of the American Congress of Rehabilitation Medicine Stroke Group's Movement Interventions Task Force offer these five recommendations to help improve transitions of care for patients and their caregivers: (1) improving communication processes, (2) utilizing transition specialists, (3) implementing a patient-centered discharge checklist, (4) utilizing standardized outcome measures, and (5) establishing partnerships with community wellness programs.

Due to changes in healthcare policy, there are incentives to improve transitions during stroke rehabilitation. Although transition management programs often include multidisciplinary teams, medication management, caregiver education, and follow-up care management, there is a lack of a comprehensive and standardized approach to implement transition management protocols during post-stroke rehabilitation. This article uses the Transitions of Care (TOC) model to conceptualize how to facilitate a comprehensive patient-centered hand-off at discharge to maximize patient functioning and health. Specifically, this article reviews current guidelines and provides an evidence summary of several commonly cited approaches (early supported discharge, planned pre-discharge home visits, discharge checklists) to manage TOC, followed by a description of documented barriers to effective transitions. Patient-centered and standardized transition management may improve community integration, activities of daily living performance, and quality of life for stroke survivors while also decreasing hospital readmission rates during the transition from hospital to home to community.

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Statement of the purpose

The purpose of this article is to review the current state of transition planning in stroke rehabilitation focusing on the transition home and into the community within the framework of the Transitions of Care (TOC) model.[1] Specifically, the aims of this paper are to; 1) review current practice and evidence relative to transitions of care in stroke rehabilitation, 2) describe gaps in transition care and offer direction for program development, 3) provide relevant assessments and tools, and 4) make recommendations based on a theoretical framework and evidence to improve care coordination for persons with stroke from hospital to home and community.

Background

Stroke rehabilitation in America is often fragmented and highly variable between healthcare systems,[2] making comprehensive and coordinated patient-centered care challenging, especially during transitions of care. One of the greatest challenges is coordination and timely transfer of information between providers to optimize outcomes. The National Transitions of Care Coalition (NTOCC) has developed a conceptual model of Transitions of Care (TOC) which defines TOC as an efficient transfer, verification, and clarification of information between communicating providers.[1] The TOC model assumes that all providers are accountable in communicating and receiving pertinent information, and most importantly, patients and families are engaged throughout the process, ultimately leading to successful transitions (see Figure 1 for TOC model diagram).[2] Successful transitions from acute care, to rehabilitation, to home and community post-stroke should be client focused, with reliable and timely communication between providers in multiple disciplines and multiple locations.

In rehabilitation, transitions of care are centered on patient discharge, usually from one level of care to another. Comprehensive discharge planning must begin early after stroke due to the short median length of time patients spend in the acute care hospital after a stroke (four days).[3] This short acute hospital length of stay gives little time for patients and their families to adjust to life changes as a result of the stroke,[4] and prepare for the long road of recovery and reintegration that lies ahead.

As transition programs have developed to facilitate the discharge process, greater attention is being focused on research to identify effective strategies and processes. Evidence suggests that specific transition planning tailored to patients and their families can reduce length of stay and readmissions and may also improve satisfaction of patients and healthcare providers.[5] Specifically, transition planning focusing on factors such as overall health, comorbidities, age, caregiver support, mobility, cognition, and self-care have been shown to be essential for successful transitions.[6,7] Unfortunately, critical gaps in transition/discharge planning for people with stroke remain.[8]

Transitions of Care

Successful transitioning from acute care, to rehabilitation, to home, and to integration into the community post-stroke demands communication between multiple providers at several clinical locations. People who have had a stroke incident and their families may experience transition in the following contexts: (1) transition from place of stroke onset to acute hospital, (2) transition from acute care hospital to other inpatient medical facilities, and (3) transition home.[9] Each transition comes with unique circumstances and concerns, but all transitions require good

communication and hand-off between providers. Even though all transitions are critical for the person's care, this paper will focus on factors related to transitioning home and community reintegration.

There are two distinct scenarios for transitioning to home. The first is a transition home with continued services through either home health or outpatient agencies. In this scenario of transition home there can be multiple senders and receivers of key information to support the transition. This is due in part to the multiple functional impairments frequently experienced by people who have had a stroke. Often when a patient transitions from an inpatient setting to home with continued outpatient or home health services there will be key information from several providers (nurse, rehabilitation therapists, physician, social worker) that needs to accompany the patient and be received by a similar group of providers at the outpatient or home health agency. Further complicating this transition is the wide variability in program types for patients leaving the inpatient setting.[9] The inherent challenges within the TOC framework at this transition is at both sender and receiver levels. Challenges at the sender level involve coordinated gathering and packaging of information to send and at the receiver level includes timely availability or distribution of key information to the waiting receivers. These challenges can lead to inefficiencies in the care being delivered at the receiving agency and an apparent lack of continuity of care from the patient and family perspective.

The second scenario of the transition home involves the patient being discharged from all healthcare services, fully relying on the family and community resources outside of the healthcare system for support. Discharges from the hospital without ongoing healthcare services have a unique set of challenges which includes reliance on the primary care physician (PCP) for

long-term clinical management and follow-up.[9] Unfortunately, most primary care physicians lack the time to manage the long-term issues related to functioning, community integration, and quality of life of the patients and families.[10,11] The healthcare system is being pressed to address these challenges and to provide effective standardized care for patients in post-stroke rehabilitation that promotes maximal functional recovery with efficient transitions home and successful community integration.

Healthcare System Context

Optimizing transitions home and to the community for stroke survivors has been reported as a key factor in achieving three important objectives of post-stroke rehabilitation: improving the care experience, improving the health of stroke survivors and caregivers, and reducing costs.[12] As the healthcare system seeks to align payment and performance, transition planning deserves special emphasis providing a ripe opportunity to respond to patients and caregivers' needs and address the barriers to successful transitions to home.

Evidence suggests that successful transitions can reduce costs by reducing hospital readmissions which is an important quality marker for hospitals. Due to financial incentive to reduce readmissions, interventions focusing on safety and medical management rather than the person's ability to engage in meaningful life activities are being emphasized.[13] This focus on medical management over the person's engagement further complicates the bigger picture of transition planning due to the wide range of psychosocial issues associated with readmissions, such as depression, activities of daily living (ADL) limitations, malnutrition, social isolation, poor self-management skills, limited health related education/literacy, and escape-avoidance coping strategies.[14-17] Instead of issuing standard discharge plans, patient specific discharge plans

may be more effective to reduce lengths of stay (LOS), decrease readmissions, and improve patient-reported health status in older adults.[18] In a systematic review of interventions' effectiveness on hospital readmissions, 15 categories were identified as important for reducing readmission rates: structured discharge planning, designated service coordinator, transition coach, timely follow-up appointment, patient-centered programs, education, self-management, patient empowerment, medication intervention, rehabilitation, home visit, timely communication, telephone follow-up, patient hotline, and electronic exchange of health data between healthcare providers.[19]

Evidence Based Practice for Transition Planning

The breadth of evidence around best practice for transition planning as part of a structured model of discharge planning ranges from targeted specific interventions to comprehensive practice models. Beneficial targeted interventions include programs for: 1) medication management,[20] 2) fall prevention[21] 3) patient and caregiver education, 4) facilitation of communication with providers in community,[22] 5) pre-discharge home evaluations, and 6) self-management programs.[3,21,23-25] While models of discharge planning vary in structure and focus, they include common characteristics, such as: 1) use of a multidisciplinary team approach,[26-29] 2) initiation at time of admission,[30] 3) engagement of the patient and care partners throughout the process,[27,31,32] and 4) high-quality communications.[32,33]

Structured discharge planning is the aim of the TOC model and important for successful transition home after rehabilitation. Structured discharge has been reported to require pre-discharge and post-discharge processes by transition providers (accountable senders and receivers of information in the TOC framework) who are involved in the day to day care of the

stroke survivor in the hospital.[22] These providers can be from any discipline (therapy, social work, nursing, etc.).[22]

The use of community health workers as transition specialists have reportedly been helpful to patients and caregivers living in rural areas, after discharge from acute inpatient rehabilitation.[34] These community health workers act as accountable receivers in the TOC framework facilitating appropriate action by identifying barriers to patient engagement and assisting the patient and caregiver with access to community resources.[34] Additionally, the emotional health[25] and engagement of stroke survivors[35] and their caregivers[34] can also influence transitions of care, thus making them significant accountable receivers of information in the TOC model, especially at the discharge to home transition.

From a systematic review, integrated multi-component programs appear to be more effective in reducing hospital readmissions, especially in high-risk populations.[36]Components of these programs include patient education, checklists, resource lists, and medical follow up information.[26,37-44] In contrast, more focused intervention models such as early supported discharge and home visits, have a proximal relationship to the desired outcome of rehabilitation: successful transitioning of patients with stroke to home and to the community.

Early Supported Discharge

As a promising model for ensuring the smooth care coordination from the hospital-based multidisciplinary specialist stroke teams to the community-based teams,[45] Early Supported Discharge (ESD) enable patients an earlier discharge from the hospital with more rehabilitation at home when community-based therapy and support services are readily available (4-5 weeks duration post-discharge).[45,46] Early Supported Discharge is a distinct, high intensity intervention

that can be offered as part of a community stroke service or by a separate dedicated team.[47] Distinguishing characteristics of ESD include: (1) interdisciplinary team with specialized stroke care expertise, (2) cohesive team functioning with weekly meetings, (3) assignment of a coordinator for each stroke survivor, and (4) screening criteria for eligibility (ESD should only be provided for stroke survivors with mild-to-moderate functional impairment and minimal cognitive impairment).[46,48] A consensus document has identified eligibility criteria, potential outcome measures, and processes to help health professionals plan and implement ESD services.[49]

The effectiveness of early supported discharge for individuals with mild to moderate stroke is accumulating. A meta-analysis concluded that nurse-led early discharge programs for inpatients with chronic disease reduced hospital readmission rates, duration of inpatient readmissions, and all-cause mortality.[50] Moreover, early supported discharge has also been reported to significantly improve quality of life, patient satisfaction, and caregivers' stress.[51,52] Continuing their recovery at home enables stroke survivors and their caregivers to construct and adapt to their 'Flow of everyday life'.[53]

Worldwide, ESD has been reported to reduce overall costs of care and healthcare utilization,[54-59] with outcomes similar to conventional care.[55] For patients with mild or moderate stroke related disability, ESD results in improved performance of activities of daily living.[58,59] Finally, the cost savings have come with a significant cost shift, meaning that ESD required significantly more occupational therapy, physical therapy, and speech therapy, and shifted costs from the hospital to the community.[57]

Home Visits

A pre-discharge home visit (PHV) is an assessment in which a rehabilitation therapist conducts an on-site evaluation of a patient's home prior to discharge, enabling the therapist to make recommendations about the home environment including equipment, home modification, and re-arrangement of items for safety and ease in use (e.g., accessibility within and around the home, floor surfaces, communication access). Prior to the patient's discharge the therapist can tailor interventions to address the specific needs of the patient.[60]

The positive impacts of PHV include: 1) patients being able to stay in their home,[61] 2) caregivers perceiving a safer transfer to home after a PHV,[62] 3) fewer falls and increased participation during rehabilitation,[63] and 4) decreased unanticipated needs for support.[64] Two negative findings associated with PHV include: (1) patients feeling anxious and judged during the visit,[63] and (2) the time demand and cost.[65] Feasibility and effectiveness data, comparing PHV and hospital-based interviews, demonstrated no statistically significant difference in functional performance as measured by Nottingham Extended ADL Scale at 1-month post-discharge.[61,66] However, a recent meta-analysis of transitional care interventions for stroke survivors concluded that home-visiting programs were most effective for reducing mortality and improving activities of daily living (ADL) after hospital discharge.[29]

Although not common in the United States, PHVs are part of routine discharge planning practices in the United Kingdom, Australia, New Zealand, and Sweden.[61,67] Pragmatics influence decisions about conducting a PHV, including institutional pressure to reduce the number of PHVs, overall decrease in length of stay (LOS), and time constraints.[61,66] Average time spent at a patient's home for a PHV ranges from 63 minutes[60] to 80 minutes.[61]

Results of an economic analysis has suggested that PHVs cost more than twice as much as hospital interviews but were slightly more cost-effective in terms of health-related quality of life.[68] A subsequent large scale randomized control trial of 400 participants has found clinically meaningful improvement; a higher proportion of patients receiving enhanced occupational therapy (OT) (pre- and post-discharge visits and two follow-up phone calls) improved in ADL with an incremental cost-effectiveness ratio of $61,906 per person, compared to in-hospital consultation OT.[69] A recent feasibility study found that enhanced rehabilitation, Community Participation Transition after Stroke (COMPASS), which received 1 pre-discharge and 5 post-discharge visits by occupational therapists, outperformed the attention-control group by 17.4 points on the Reintegration to Normal Living Index, a measure of community participation.[70]

An emerging alternative to PHV uses technology to visualize the home environment and simulate modifications before implementation.[71] Virtual reality and 3D interior design applications can increase collaboration between therapists and clients, and may serve as potential mechanisms to empower the patient to be more engaged in decision-making during discharge planning.[72] The use of digital photos has also been investigated as a reliable method for making accurate prescriptions for equipment in the bathroom and toilet areas as compared to conventional PHVs.[73] As these technologies evolve, they have potential to improve access to PHV as a virtual therapeutic activity and may decrease associated costs.

Barriers to Transition Planning

While an increasing number of programs have been developed to facilitate the discharge process, critical factors remain due to several patient and system issues. Unfortunately balancing the patient and system needs can lead to policies that are more system-centered instead of

patient-centered, which can impede the achievement of optimal transition plans that best support patients' level of potential.[8] Barriers to transition planning can be considered within four categories: systems, healthcare professional, patient, and caregiver.[74]

Systems

System level barriers include premature discharge due to bed availability, inconsistent procedures for implementation of discharge planning (piecemeal planning), insufficient procedure for medication education, manpower shortages, administrative demands, transparency and portability of the medical record.[75] The dynamic process of stroke recovery combined with the multiple stakeholders (e.g., therapists, pharmacies, equipment vendors, specialists) required to implement stroke rehabilitation increase the complexity of stroke rehabilitation from a systems perspective.[8] Further complicating these challenges from a systems perspective is the influence of insurance type, eligibility criteria on the patients' progress through rehabilitation, and LOS.[76]

The Centers for Medicare and Medicaid Services' (CMS) is collecting information about discharges to the community as part of the Improving Medicare Post-Acute Care Transformation (IMPACT) Act of 2014,[77] which aims to facilitate care coordination and provide quality, patient-centered care across post-acute care (PAC) settings. The CMS Discharge To Community Measure provides the rate of successful discharges to the community (i.e., discharge to a community setting without post-discharge unplanned readmissions or death).[78] Although this measure is a step in the right direction, we lack information about discharges to the community specifically for stroke survivors and the non-Medicare population.

Healthcare Professional

Healthcare professionals face many barriers to successful discharge planning across settings due to dynamic complex variables and frequently, non-linear pathways. Barriers identified by healthcare professionals include poor communication across disciplines and misunderstanding of roles and responsibilities, leading to patient/caregiver unpreparedness.[75,79] Specific barriers include miscommunications regarding patient education, ordering of equipment, delayed or lack of critical EMR information, and discharge destination. A coordinated, timely, and efficient communication of the discharge plan between healthcare professionals is vital to optimize outcomes of stroke survivors. Factors that influence communication during the transition from sender to receiving provider include lack of standardized discharge documentation and multiple modes of communication (e.g., phone, email, text message, document).[75,80]

Patient

From a patient perspective, the effects of a stroke can disrupt day to day living, affecting mental and physical functions. Stroke survivors may have to cope with more limitations of movement, speech, and daily functioning within a relatively short time period. Meanwhile, discharge planning teams identify patients' resources and levels of family and caregiver support.[76] Patients' knowledge of their condition, risk factors, and stroke prevention may vary,[34] necessitating the tailoring of patient education to improve health literacy. Social determinants of health, such as lack of transportation and financial hardships, can affect follow-up care, particularly in rural communities.[34] Confusion for patients and caregivers resulting from multiple

recommendations (some conflicting) and limited resources or social support can also create significant barriers for patients at the time of discharge or transition home.[8]

Some common issues around discharge planning for patients include confusion over medications, follow up appointments, getting needed referrals, having necessary equipment at home, coordinating home health services, and inadequate self-management.[14] Issues related to self-management may influence patients' ability to locate resources such as transportation and exercise. The most commonly reported barriers to exercise in post-rehabilitation stroke patients were cost, lack of awareness of fitness facilities, lack of transportation, and lack of knowledge of how to exercise.[81] Other possible barriers for people with stroke involve access to participation in social interactions and return to important roles in their homes and communities.

Caregiver

Common issues faced by caregivers include poor communication about discharge dates and specific responsibilities of the caregiver. Additionally, caregivers' needs change across stroke survivors' recovery trajectory and across the care continuum.[82] Since the median length of stay in acute care post-stroke is only four days,[3] giving little time for patient and family to adjust to life changes,[76] discussions about discharge planning should begin as soon as possible.

Despite stroke practice guidelines' recommendations to include caregivers throughout the continuum of stroke care,[83] a critical gap between actual and ideal services for caregivers of patients with stroke remain.[84] A care support program for patients with stroke and their caregivers in a rural area found that assistance was required for the following areas: patient-provider communication; insurance support; accessing follow-up care; education on managing chronic health conditions, the stroke process, transfers and mobility; and accessing durable medical equipment and

essential medications.[34] Furthermore, participants in this navigator program showed good health care utilization outcomes: no 30-day emergency department visits and only one 30-day hospital readmission, which was not stroke-related.[34] Thus, caregivers should be considered as receivers of information in the TOC framework for patients as they discharge to home. Although addressing these elements requires resources and time, patient-centered discharge planning that includes caregivers as team players in the TOC framework will likely improve the health and patient-reported outcomes of stroke survivors and their caregivers.

Recommendations

Structured transition planning is challenging due to lack of standardized processes and quality markers for implementing and assessing the effectiveness of transition planning during post-stroke rehabilitation. As members of the Movement Interventions Task Force we developed five recommendations organized into three broad categories to help clinical providers improve success and standardization of patient transitions to home (see Table 1).

Category 1: Improve Communication Processes

The complexity and multiple step processes required for preparing patients with stroke for safe discharge to their homes has been highlighted by several clinical practice guidelines.[33,85-87] Two common themes among these guidelines include communication between care providers (within settings and across transitions) and utilization of case managers/stroke navigators to follow-up after discharge.[8,85,88] Unfortunately, no quality measures specifically for patients with stroke exist in National Quality Forum's measures database to address these recommendations, which can lead to less incentive within the healthcare system to develop and implement

programs to comply with the guidelines.[89] The themes of communication and case managers can be easily conceptualized within the TOC framework. Communication between providers is inherent throughout the TOC framework, requiring identification of sending and receiving providers at all levels of care within the healthcare system.

Under the category of *Improve Communication Processes,* t**he first recommendation** is for clinical care providers to establish sending and receiving providers within each level of care and to confirm who the sending and receiving providers are within systems from which patients are referred, and **the second recommendation** is inclusion of a case manager/transition specialist as a receiving provider at the discharge to home transition.

Due to the lack of one accepted guideline, we have created a *"Patient-Centered Checklist for Discharge to Community"* (PCC-DC) to help facilitate communication between the patient, transition specialist, and other providers. **The third recommendation** is consistent utilization of the PCC-DC, or a similar checklist, to ensure that the appropriate information is being forwarded to receiving providers and that patients are included in the process at each transition of care. The PCC-DC is a compilation of common items from several checklists and practice guidelines to facilitate discussion and development of standardized practices for effectively transitioning patients to their homes for community reintegration after discharge from stroke rehabilitation (see Table 2).[33,85-88,90,91] This checklist offers specific medical and functional components for planning, implementing, and following up after discharge. Further, the checklist addresses a gap by including a category of Home Readiness, which includes home modifications and equipment needs. This checklist could potentially be used to help determine if a stroke survivor is a good candidate for early supported discharge. The PCC-DC includes patients and caregivers as

receivers in the TOC model by ensuring that patients and families are engaged in the process (i.e., sign off per item), making this checklist more patient-centered. Another important aspect of this checklist is that it may be customized for each organization. Finally, the checklist also identifies other key receivers, such as Primary Care Physician (PCP), as well as specific information that should be forwarded to appropriate community resources for the patient.

Category 2: Use standardized assessments

Establishing sending and receiving providers at all levels of care can help facilitate continuity of care only if the information being shared is translatable in each level of care as the patient transitions. We have identified several outcome measures for use with people with stroke that can inform discharge/transition decisions. An overview of common assessments across functional domains (i.e., cognitive function, ADL, community integration, balance, walking, motor skill, and quality of life) is provided in Table 3 to guide clinicians. These general domains of assessments were selected because of evidence linking the domain to problems related to discharge. Clinicians can search for other relevant assessments and their review summaries on Shirley Ryan's Rehabilitation Measures Database.[92] **The fourth recommendation** is consistent utilization of appropriate standardized outcome measures between levels of care and healthcare systems to support smooth transitions of care for patients and their caregivers.

Administration of standardized assessments to stroke survivors is important for informed clinical decision-making and care planning, as well as measuring of progress and quality.[87] Standardized patient assessment data provides an objective measure of: (1) the impact of stroke, (2) patients' progress, and (3) effectiveness of the intervention trial.[93,94] If consensus about the standardized assessments is reached across facilities regionally and along the care continuum, we

can better understand: (1) the longitudinal recovery of stroke survivors and (2) outcome variations across similar settings.[95,96] Consensus across the care continuum could make care more efficient by reducing the need for assessments when patients transition to another clinical setting (e.g., acute care to rehabilitation). As utilization of standardized measures increases, it will be necessary to establish consensus on the best measure for each domain (see Table 3).

Category 3: Fill in the gaps in the TOC

The objective of improving discharge planning is to facilitate an efficient, effective, and patient-centered TOC between rehabilitation and post-rehabilitation activities. Unfortunately, there is an apparent lack of sending and receiving providers between medical rehabilitation and community-based wellness stakeholders leaving patients struggling to find access to safe and meaningful leisure/recreational and fitness activities. Instead of making connections with community-based stakeholders that can facilitate participation in the context of the broader community, patients find themselves struggling to *"…renegotiate their disabled bodies and changed identities in real life"*.[97(p8)]

This struggle calls for a change in the traditional discharge approach from rehabilitation to post-rehabilitation activities. Although the traditional approach is prescribing a home exercise program to promote recovery after rehabilitation, adherence rates have been reported to be less than ideal,[98] except in a structured supervised program where adherence was 100%.[99] Low adherence outside of a structured supervised program indicates that rehabilitation therapists should explore partnerships within the community to educate community stakeholders, advocate for patients, and start bridging the gap for patients and caregivers as they move beyond the walls

of the rehabilitation clinics to the community to renegotiate their life in a way that is productive and meaningful.

Limitations in life participation after stroke has been frequently reported,[100,101] particularly in the areas of social, recreation, and leisure activities.[81,102] Stroke survivors and caregivers report a variety of reasons for this limitation in participation: more sedentary lifestyle,[81] lack of motivation, low self-efficacy, inaccessibility of community programs, weakness, poor balance, lack of transportation, and cost.[81,101] Walsh and colleagues identified four themes related to community integration after stroke including: (1) *primary effects of stroke* (fatigue, poor mobility, memory problems, and communication difficulties; (2) *personal factors* (optimism, hope, perseverance, confidence, meaningfulness of activities, adjusting expectations, and finding new life values and life goals); (3) *social factors* (stigmatization from family and the broader community, family support, feeling like a burden, environmental barriers, ability for key activities such as climbing stairs and driving, and ability to contribute); and (4) *relationships with professionals* (correlation between therapy activities and own home environment, good support and encouragement, losing momentum with delays or discontinuous care, feeling controlled and limited in options).[103] These findings suggest that care coordination between medical rehabilitation professionals and community wellness professionals is needed to help patients transition home.

According to the World Health Organization (WHO), rehabilitation for persons with disabilities must aim to enable the person to participate in meaningful roles, routines, and activities, and must address the physical, sensory, intellectual, psychological and social functioning of an individual.[104] The WHO defines participation as *"involvement in a life*

situation" and describes efforts to promote participation as interventions (accommodations, public education, anti-discrimination law, and universal design) or prevention strategies (environmental change, employment strategies, accessible services, universal design, lobbying for change, and preventative rehabilitation).[104] Although many of these strategies involve action at a community level, there are still opportunities for rehabilitation therapists to directly influence participation at an individual patient level. Prevention strategies such as environmental change, accessible services, and preventative rehabilitation may all be amenable to post-stroke rehabilitation across all levels of post-acute care (PAC) with a focus on eventual transition to home. Unfortunately, successful transitions through rehabilitation to the community that maximize patient's life participation have yet to be fully realized. Therefore, **the fifth and final recommendation** is establishment of partnerships with community-based wellness programs to establish receiving providers within the community in the TOC model for patient hand-off at the transition to community living after completion of all structured medical rehabilitation.

Conclusion

Transition planning for people with stroke can be challenging and complex requiring careful advanced planning, excellent communication among many stakeholders, and tailored education and training. The TOC model has defined good transition management as efficient transfer, verification, and clarification of pertinent information between providers to facilitate appropriate action for the patient. Despite practice guidelines, programs, models, assessments, and interventions that can serve as resources to support efficient information transfer, there is not yet a consensus based on best practice for facilitating smooth and efficient TOC throughout the continuum of post-stroke care.

The following recommendations have been developed based on the current evidence to focus efforts on standardizing transition planning and to facilitate more efficient transitions throughout the stroke continuum of care: (1) establish sending and receiving providers as defined within the TOC framework for facilities managing patients with stroke; (2) establish a case manager or transition specialist as a receiving provider within the TOC framework at the discharge to home transition; (3) consistently utilize comprehensive discharge checklists such as the PCC-DC; 4) consistently utilize standardized outcome measures to improve consistency of information passed between levels of care; and 5) include community-based wellness programs as receivers in the TOC framework to improve patient hand-off at the rehabilitation to community transition.

More efficient transitions are vital at all levels of care and an important focus for all stakeholders. A focus on efficient TOC has potential to promote integrated and coordinated care, maximize functional recovery, and support return to the least restrictive living environment for stroke survivors. Thus, high-quality discharge planning can facilitate good community integration and life participation, which is the ultimate objective of rehabilitation, and perhaps the best defense against secondary stroke risk factors and costly hospital readmissions.

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Table 1. Recommendations for Transition Management during Stroke Rehabilitation

Improve Communication Processes	1. Establish and confirm sending providers (discharging facility) and receiving providers (admitting facility) within each level of care 2. Establish case manager/transition specialist as a receiving provider at discharge to home transition 3. Utilize PCC-DC or similar checklist to ensure forwarding of appropriate information and inclusion of patients
Use standardized tests and measures	4. Consistent use of standardized tests and measures in all level of care
Fill-in the gaps on the TOC	5. Establish partnerships with community-based wellness programs as receiving providers in the TOC framework

Table 2. Patient-Centered Checklist for Discharge to Community (PCC-DC)

Healthcare Date/Initials	**Transition planning tasks**	**Patient or Caregiver** Date/Initials
	Patient engagement and communications	
	1. Patients/caregivers are asked about goals, resources, preferences, and concerns about transfer of care. 2. Discharge summary is explained to patients/caregivers (use teach□back if needed). 3. Patients/caregivers receive training in care (eg, techniques for personal care/handling, communication strategies, prevention and health maintenance, safe swallowing/ dietary modifications, management of behaviors and behavioral health issues). 4. Notify and provide to patient/caregiver, pharmacy, Primary Care Physician (PCP), & home health agency: Discharge Summary Plan, Medication Reconciliation Form, contact information of hospital staff. 5. Agreed health and social care plan is in place with all stakeholders, and patient/caregiver knows whom to contact if difficulties arise.	
	Follow-up	
	6. Confirm and identify patient's PCP; alert care team if no PCP and/or begin PCP search. 7. Stroke rehabilitation team member follows up within 72 hours after discharge to check on patients/caregivers' needs. 8. Patients are regularly reviewed by stroke team to assess recovery, prevent deterioration, maximize functional and behavioral health outcomes, and improve quality of life (eg, first week, 6 months, 12 months).	

9. Patients who experience a change/decline in functional status should be re-assessed, even if months after stroke.
Medication and health management
10. Teach patients/caregivers how to properly use discharge medications and how these relate to their previous medications. 11. Patient's medication management ability has been assessed. 12. Interventions and resources for safe and accurate medication management (eg, low vision, decreased dexterity, cognitive deficits) have been provided. 13. Monitor second stroke risk factors (eg, blood pressure, blood sugar, cholesterol, smoking cessation, stress, exercise, weight management, sedentary lifestyle)
Home readiness
14. For patients with mild/moderate stroke, assess if early supported discharge (comprehensive multidisciplinary rehabilitation available) is feasible. 15. Assess patients and need for a home visit (eg, OT/PT/Nursing, family), to ensure functioning and safety in self-care activities. 16. Assess caregivers and need for home modifications (eg, grab bars, tub bench, ramps) and plans/resources are discussed with patients/caregivers. 17. Appropriate equipment (eg, specialist seating, wheelchair) is in place at patient's residence by discharge date. 18. Provide referrals and resources for aids/equipment and support services to maximize recovery and enable participation (ie, transportation, support groups, day programs).

Table 3. Standardized Measures for Domains Related to Discharge Planning

Assessment	Description	Implications for Discharge
Cognition		
St. Louis University Mental Status Exam (SLUMS)	A 30-point screening questionnaire testing orientation, memory, attention, and executive function.[105]	No studies linking SLUMS to discharge. Cognitive impairments were found to contribute to increase length of stay in hospital for persons with stroke.[106] A study comparing the SLUMS to the MMSE suggest the SLUMS is more sensitive to mild neurocognitive deficits.[107]
Mini Mental State Exam (MMSE)	Eleven questions. Total score of 30. Assesses orientation, immediate & short-term memory, calculations, language, & visuoconstruction skills.[108]	No specific research linking MMSE to discharge. Cognitive impairments contributed to increased length of stay in hospital for persons with stroke.[106] Score of 21-26 mild, 11-20 moderate, and < 11 severe impairment.[108]
Montreal Cognitive Assessment (MoCA)	Total score of 30. Assesses attention, memory, language comprehension and production, & visuoconstructional skills.[109]	Cutoff score of < 26 reflects cognitive impairment. In population with stroke, MoCA was found to be more sensitive to detecting mild cognitive deficits when compared with MMSE.[110] MoCA has been found to more accurately predict discharge destination in patients with stroke when compared to MMSE.[111]
Executive Function Performance Test (EFPT)	Measures performance in 4 ADLs, cooking, telephone, bill paying, & medication management. Scores initiation, organization, safety, judgement, and completion. Possible score of 0-25 in each area for total score of 100. Higher scores indicate higher functioning.[112,113]	EFPT during the acute phase of stroke may aid therapists in discharge planning.[114] For adults post-stroke, a score of 84 or less was five times more likely to need supervision after discharge.[115]
Depression		
Patient Health Questionnaires (PHQ2, PHQ9).	The self-administered PHQ9 contains items from the DSM-IV classification for depression	On PHQ9 < 15 minimal to minor depression. A score > 14 is major depression. Depression has been linked

	including anhedonia, depressed mood, trouble sleeping, feeling tired, change in appetite, guilt or worthlessness, trouble concentrating, restless, and suicidal thoughts.[116] The PHQ2 contains 2 questions about anhedonia and mood. Items are rated based on frequency within the past two weeks. Scores range from 0 – 27 with 27 reflecting highest level of depression. The PHQ2 has a range of 0-6 with 6 being reflective of depression.	to higher levels of readmission, mortality, and decreased participation post-stroke.[17,117,118] Identification of depression using the PHQ9 can inform healthcare providers of needed interventions including education and treatments. [119]
Activities of Daily Living		
Barthel Index (BI) and Modified Barthel Index (MBI)	Observational assessment measuring 10 BADL items (feeding, bathing, grooming, dressing, bowels, bladder, toilet use, transfers, mobility, and stairs).[120,121]	BI and MBI were predictive of fall risks, functional recovery, disability, and length of hospital stay for persons with stroke.[122-124] Barthel Index score >35 was found to be a good predictor of discharge home.[125]
Assessment of Motor and Process Skills (AMPS)	Observational assessment measuring 16 motor and 20 process skills and the effect on BADLs and IADLs. The AMPS is valid with some predictive ability, its clinical utility is limited due to required certification to administer and lengthy administration time.	AMPS has been found to be predictive of assistance level for safe community living.[126,127] The processing component has been found to be more accurate than the motor component in determining community independence.[128,129]
Activity Measure for Post-Acute Care (AM-PAC) and "6-Clicks" (a version of the AM-PAC)	Observational assessment measuring basic mobility, daily activities, and applied cognition.[130] "6-Clicks" assesses basic mobility (walking, moving) and daily activities (dressing, toileting).[131]	Scores on mobility and daily activity were found to accurately predict post-discharge destination when administered in acute care.[131]
Personal Care Participation Assessment & Resource Tool (PC-PART)	43 items measuring dressing, hygiene, nutrition, mobility, safety, environment, and supports.[132]	PC-PART has low to moderate correlation with the FIM and low to moderate discriminant ability to determine discharge destination.[133]
Medication Management		
Manage-Med	The MMS has 32 questions	Able to differentiate those dependent in

Screen (MMS)	related to medication management. Possible score of 42.	taking medication from those who are independent. Mean scores were 13.8 (6.0) and 30.7 (6.1) respectively.[134]
Community Integration		
Return to Normal Living Index (RNLI)	11 question self-report questionnaire designed to assess a person's satisfaction with performance of everyday activities. Uses a 10 cm VAS with a possible total 100 (converted score).[135]	Strong correlations between RNL-I, balance and fall self-efficacy, community mobility, and stride time.[136] Higher scores on RNL-I were linked to emotional and physical well-being. Engagement in valued activities.[117,137]
Stroke Adapted Sickness Impact Scale 30 (SA-SIP 30)	30 question self-report questionnaire. Scores are converted to percentage ranging 0%-100%. Higher scores reflect low functioning.[138]	Found to be a good predictor of community participation for persons with mild stroke.[139] A score of > 33 reflected poor health profiles.[140]
Balance		
Berg Balance Scale (BBS)	Performance assessment of static and dynamic activities. Maximum score is 56. Each item is scored on scale of 0-4 with lower scores reflecting greater risk for falling.[141]	BBS scores predicted length of stay, discharge destination, motor ability 180 days post-stroke and disability level at 90 days.[142] It is criterion referenced for increased fall risk (<42).[141]
Dynamic Gait Index	Performance based 8 items scored from 0-3. Higher scores reflect higher performance. Maximum score: 24.[143]	DGI is criterion referenced for increased fall risk in people post-stroke (<19).[144]
Postural Assessment Scale for Stroke Patients (PASS)	Performance based 12 items scored 0-4 for a maximum score of 36.[145]	The PASS was found to have predictive validity for comprehensive ADL function in patients 1year post-stroke. The PASS was found to have a ceiling effect for mild stroke.[146]
Walking		
10 Meter Walk Test (10MWT)	Performance assessment scored by time to walk 10 meters.	Walking speed has been reported to predict category of walking status (<0.4 m/s household ambulation, 0.4 m/s – 0.8 m/s limited community ambulation, and > 0.8 m/s community ambulation) in people post-stroke.[147]

6 Meter Walk Test (6MW)	Performance assessment scored by time to walk 6 meters.	Recent data suggest that walking distance, measured with the 6MWT, may be better able to discriminate between limited and full community ambulation potential than walking speed.[148]
Timed Up and Go	The TUG is a standardized assessment of functional mobility. The patient is timed from the point of standing from a chair, walking 3 meters, turning, returning to the chair, and sitting down.[149]	A greater than 14-second pace is considered a higher risk for falls.[144]
Motor Skill		
Activity Measure for Post-Acute Care (AM-PAC) and "6-Clicks" (a version of the AM-PAC)	Observational assessment measuring basic mobility, daily activities, and applied cognition. 122 "6-Clicks" assesses basic mobility (walking, moving) and daily activities (dressing, toileting).[131]	Scores on mobility and daily activity were found to accurately predict post-discharge destination when administered in acute care.[131]
Rivermead Mobility Index (RMI)	14 self-reported items and 1 observed item. Scored as a 0 or 1 for a maximum score of 15. The higher the score the greater the mobility.	Early after stroke RMI scores have been reported to be useful in predicting institutional (hospital & nursing facility) length of stay.[150] RMI score >4 predictor of an early discharge home, followed by a Barthel Index score >35.[125]
Caregiver Factors		
Caregiver Strain Index (CSI)	Self-report assessing the effect of caregiving on employment, financial, physical, social, and time.[151,152]	The CSI can determine high levels of caregiver burden (score > 7).[153]
Hospital Anxiety and Depression Scale (HADS)	14 item scale: 7 items for depression and 7 for anxiety. Items are rated from 0-3 for a total score of 21 on each scale. The lower the score the less anxiety and depression.[154]	A score of 8 or more on a subscale on the HADS indicates high anxiety and/or depressive symptoms.[118,154]
Nutrition		
Mini Nutritional Assessment (MNA), MNA-	MNA consists of 18 items including body measurements	Poor nutrition is linked to frailty and decreased mobility in older adults. In one study the MNA-SF identified

SF	and questions. The MNA can be administered in about 10 minutes with a max. score of 30. Scores indicate level of nutrition: adequate MNA ≥ 24; risk of malnutrition MNA 17-23.5; malnourished < 17.[155] The MNA-SF was developed for screening low risk patients. The MNA-SF takes 5 minutes, max. score is 14. A score ≤ 11 suggest malnutrition and full MNA is recommended.[156]	malnutrition or risk in 76.7% of a population 65-97 in an acute hospital.[157] As a health initiative, prevention of chronic disease includes healthy dietary habits. Identifying persons at risk for poor nutrition is critical for promoting healthy lifestyles.
Quality of Life		
Short Form – 36 (SF-36)	SF-36 includes eight subscales: physical functioning, role limitations due to physical problems, general health perceptions, vitality, social functioning, role limitations due to emotional problems, general mental health and health transition. The 8 subscales are transformed onto scale of 0-100. A higher score indicates greater health.[158]	A criterion reference for predicting 5-year mortality has been reported for the SF-36 (score ≤40 represented a twofold higher risk for 5-year cardiovascular or all-cause mortality).[159]
Stroke Specific – Quality of Life Scale (SS-QOL)	SS-QOL is a patient-reported measure of 12 commonly affected domains (mobility, energy, upper extremity function, work & productivity, mood, self-care, social roles, family roles, vision, language, thinking, and personality).[160]	The SS-QOL and NIHSS scores independently predicted good overall health-related QOL.[161]
National Institutes of Health Stroke Scale (NIHSS)	NIHSS is a patient-reported 15-item impairment scale. Scores range from 0-42. The higher the score the greater the severity.[162]	The NIHSS is used to classify severity of stroke as follows: mild stroke, cut-offs 0-4 and moderate stroke, cut-offs 5-15.[162]
Stroke Impact Scale (SIS)	The SIS measures 8 domains (strength, hand function, ADL/IADL, mobility,	When compared to the SF-36, the SIS may be more informative. The SIS includes a wider range of difficulty on

	communication, emotion, memory and thinking, and participation/role function) and is sensitive to change over time.[160]	the physical and participation subscales. The SIS was more accurate in measuring physical functioning and social well-being.[163]

Figure 1: Transitions of Care Process and Systems Barriers